SSPA Transmitter

Solid State Phased Array Transmitter

Overview

Given the reality of today's warfare, it is critical that the transmission range of active systems is fully optimized, maximizing radar jamming effectivity. Elbit Systems EW and SIGINT - Elisra (Elisra) has developed a unique, compact and lightweight Solid State Phased Array (SSPA) transmitter covering all airborne, ground and naval platforms.

The high-performance system requires minimum power consumption – with less heat dissipation and low SWaP (Size, Weight and Power) – providing a transmitter that is technologically sophisticated as well as cost-effective. Through utilization of the Phased Array technique, Elisra's SSPA Transmitter provides a relatively narrow main beam and a high ERP (Effective Radiated Power).

Elbit Systems™
EW and SIGINT - Elisra

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Transmitter Description

The SSPA Transmitter utilizes numerous independent, active Solid State Transmit/Receive (T/R) modules that are multi-stage RF amplifiers. The bidirectional RF inputs are passed through a variable gain amplifier and variable phase shifter, which are time-shared between transmission and reception. The narrow beam steering is achieved by setting each T/R module with a phase shifting that depends on the direction of arrival and the wavelength of the threat. The T/R modules for the various frequency bands are based on GaAs and GaN technology.

Main Capabilities

- Power amplification of input RF signals in Pulse and CW modes
- Interfacing various antenna array (1D/2D) configurations according to the required ERP and spatial coverage
- Multiple antenna arrays
- Wide beam capability
- Supports accurate Direction Finding (DF) capability using phased array principle
- Various frequency bands according to the mission and uses
- Simple interface and communication to LPRF (Low Power RF) and processor unit
- Very fast switching time between:
  - Transmission to Reception (and vice versa)
  - Antenna arrays
- Enhanced BIT (built-in-test) capability
- Warm up time - not required
- Dedicated monitoring tools for real-time lab integration

Technical Specifications

ERP 64 dBm / 70 dBm / 76 dBm

Frequency Range

- Low Band SSPA (LBSSPA): 2-6 GHz
- High Band SSPA (HBSSPA): 6-18 GHz
- Dual Band SSPA (DBSSPA): 2-18 GHz
- MMW Band SSPA (MMWBSSPA): 32-38 GHz

Spatial Coverage (for each antenna array)

- Azimuth 120° (±60°)
- Elevation 40° (±20°) for 1D antenna array

Pysical Characteristics

Parameter	ERP Configuration (dBm)		
	64	70	76
Weight (kg)	13	26	52
Volume (liters)	9	18	36
Power Consumption (watts)	900	1800	3600

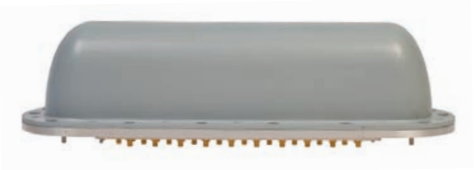
Dimensions (for 64 dBm configuration)

- Lenght 27 cm
- Width 24 cm
- Height 14 cm

Integration and Support

Elisra has the capability as well as extensive global experience in the integration of transmitters with all types of existing LPRF units - covering all airborne, ground and naval platforms. The transmitter can be customized to meet the customer's needs.
The Company can also supply a full range of support tools as required.

Rear view Front view



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